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PUBLIC HEALTH REPORTS.

THE TREATMENT OF HOOKWORM DISEASE.

By CH. WARDELL STILES, Ph. D., Chief of the Division of Zoology, Hygienic Laboratory, United States Public Health and Marine-Hospital Service.

The fundamental principle underlying the treatment of hookworm disease is the same as that which underlies the treatment of all other zooparasitic diseases, namely, first treat the parasite, not the patient. After the parasite is treated, attention may be directed to treating the patient.

Although hookworm disease may occur in persons in any walk of life, it is particularly among the poorer classes that it is found, and the average hookworm patient (children excepted, to a certain extent) can not afford to lose several days' wages to undergo treatment. It is therefore frequently expedient to conduct the treatment Saturday evening and Sunday morning. It will often be found difficult to arouse the interest of a community in regard to the presence of hookworm disease and the need of treatment. This can frequently be done however, if it is borne in mind that the resulting anemia is, in common with other anemias, a frequent cause of amenorrhea.

Warning.—Notwithstanding that primarily we are to treat the parasite, not the patient, it should be remembered that if too great a quantity of thymol is absorbed by the patient, alarming symptoms and even death may occur. Accordingly, the patient and the patient's family should be carefully warned not to permit the patient under any circumstances to have on the Sunday during which the treatment is given any food or drink containing alcohol, fats, or oil. Patent medicines should be mentioned in particular, because of the alcohol many of them contain, and even milk and butter should be forbidden. I know of one case of serious thymol poisoning which followed promptly after the patient took a copious drink of milk the day thymol was taken.

Preliminary treatment.—On Saturday evening give a dose of Epsom salts. The reason is this: The hookworms are surrounded by more or less mucus and partially digested food. Unless this is removed, the thymol may not reach the parasites, but may reach the patient, and this is contrary to what is desired, as the thymol is intended for the parasite, not the patient.

Thymol treatment on Sunday.—(1) Position of patient: Instruct the patient to lie on his right side immediately before taking the drug and to remain in that position for at least half an hour after. The reason for this is that many of these patients have enlarged stomachs, and if they lie on their right side, the drug has the benefit of gravity in passing

rapidly from the stomach to the intestine; but if any other position is assumed, the drug may remain in the dilated cardiac portion of the stomach for some hours and result in considerable complaint on the part of the patient and delay of the drug in reaching the worms.

(2) Time of dosage: The time of giving and size of dose should be arranged on one of two plans, depending on existing conditions.

(a) The plan usually followed is: At 6 a. m., one-half of the total dose of thymol; at 8 a. m., one-half of the total dose of thymol; at 10 a. m., Epsom salts (never castor oil).

(b) If the case is an especially severe one, or if the patient has, upon the first Sunday's treatment, complained of burning or other effects of thymol, the following plan is adopted: At 6 a. m., one-third of the total dose of thymol; at 7 a. m., one-third of the total dose of thymol; at 8 a. m., one-third of the total dose of thymol (if unpleasant symptoms, as a sensation of severe burning in the stomach, have appeared this third dose should be omitted); at 10 a. m., Epsom salts (never castor oil).

(3) Food: No food is allowed until after the 10 o'clock dose of Epsom salts, but the patient is permitted to take a glass or so of water after the thymol, if he desires.

(4) Thymol: Finely powdered thymol in capsules, preferably in 5-grain capsules, should be used.

(5) General rule as to age: In the table of dosage given in the next paragraph, the maximum dose per day to be adopted as a routine is given for various age groups. In determining the dose, however, the rule should be followed of taking the apparent rather than the real age and of not hesitating to cut down the dose even lower in case of unusually severe cardiac symptoms or other unfavorable conditions. Thus for a boy 16 years old, who appears to be only 12 years old, or in whom the anemia is especially marked, resulting in severe cardiac symptoms, the quantity of thymol should be reduced to the 12 or even the 8 year dose. Some authors give the impression that it is useless to give thymol for this disease unless the full dose is administered. This view is not in harmony with my experience.

(6) Size of dose: The following doses represent the maximum amount to be used during one day's treatment for the age groups in question. It is practically the same table that the Porto Rican Commission has been using:

	Grains.
Under 5 years old.....	7½
From 5 to 9 years old.....	15
From 10 to 14 years old.....	30
From 15 to 19 years old.....	45
From 20 to 59 years old.....	60
Above 60 years old.....	30 to 45

Total dose, to be divided as indicated in paragraph (2).

Repetition of treatment.—The foregoing treatment is repeated once a week, preliminary treatment Saturday evening and thymol on Sunday morning, until the patient is discharged.

Duration of treatment.—To recognize whether the parasites are all expelled, and therefore to determine when to end the thymol treatment, either of two plans may be adopted, namely:

(a) Microscopic examination: On Saturday morning make 10 microscopic preparations of a fresh stool. If eggs are still present,

repeat the treatment; if eggs are not found, discontinue the thymol. It takes about forty to sixty minutes to make this examination of 10 slides thoroughly.

(b) Cheese-cloth method: A much easier way of recognizing the completion of the treatment, and for practical results nearly as satisfactory as the microscopic examination, is the following: Instruct the patient to wash all of his stools Sunday, Monday, and Tuesday, through a cheese cloth and to keep the cheese cloth moist and bring it to the office on Tuesday. While the fecal material will wash through, the worms will be retained in the cloth. Continue treatment as long as worms are found in the cheese cloth.

Other treatment.—If desired, iron may be administered on the days on which the thymol is not taken. It is a good plan, however, not to give iron during the first week, for it is quite important to convince the patient that the thymol treatment is the one which is really accomplishing the lasting good. If the drug is taken Sunday, the patient is likely to begin to feel some benefit by Wednesday or Thursday; his family is likely to notice it on Thursday or Friday. If iron is given during the first week, the conclusion may possibly be drawn by the patient that it is really the iron which is causing the improvement, and he may discontinue the thymol. Of the two, the thymol is, of course, the far more important, for it reaches the parasite, while the iron reaches only the patient.

UNITED STATES.

[Reports to the Surgeon-General, Public Health and Marine-Hospital Service.]

Reports from San Francisco, Cal.—Plague-prevention work at San Francisco, Oakland, and Point Richmond, and in Alameda County, Cal.

Surgeon Blue reports:

SAN FRANCISCO, CAL.

Date of last case of human plague: Sickened, January 30, 1908.

Date of last case of rodent plague: October 23, 1908.

Week ended July 31, 1909.

Dead inspected.....	98
Plague.....	0
Premises inspected.....	1,999
Houses disinfected.....	3
Houses destroyed.....	3
Buildings condemned.....	7
Nuisances abated.....	217
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Rats found dead.....	33
Rats trapped.....	2,217
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Total rats taken.....	2,250
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Rats identified:	
Mus norvegicus.....	1,639
Mus rattus.....	43
Mus musculus.....	532
Mus alexandrinus.....	11
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Total.....	2,225
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